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THE GEOGRAPHICAL FACTOR IN AGRICULTURAL INDUSTRIES*

We have in the middle West, between the 98th meridian and the Rocky Mountains, a stretch of prairie land known as the Great Plains. From the 33rd parallel to the Canadian border the climatic conditions are singularly uniform, and the soil, though varied, is generally very fertile. The one great handicap of the region is insufficient rainfall. The population is sparse and doubtless will continue so, but the transportation facilities are excellent and constantly improving. Roughly speaking, half of our commercial grain crop is produced in that region. Wheat is the chief money crop and should remain so; but the continuous and exclusive production of wheat is out of the question. The labor requirement of the wheat crop covers but a few weeks in the year and the time limits are sharp. Furthermore, continuous wheat production leaves the land weedy and yields decline rapidly. A rotation involving corn on the land once in three or four years obviates this weed trouble and lengthens the labor season by a few weeks. But corn is precarious as a grain crop because of the late summer droughts. These droughts do not affect so seriously the value of corn as a forage crop, but a forage crop is too bulky to justify long shipment to market. Thus we find that if we would have permanent and prosperous agriculture on the Great Plains and continue the production of our share of the world's wheat supply we must establish there some animal industry to utilize the forage incident to the rotation requirements of wheat production and to provide at the same time continuous employment for a larger proportion of the labor needed for the wheat crop.

This is one aspect of the situation. Another view is that west of the Great Plains lie the upland ranges of the Rocky Mountains with their rich summer pastures and sheltered valleys for winter feeding. This is a vast natural breeding ground for live-stock. From these ranges the meat animals move eastward across the Great Plains to eastern markets. But the range stock must be fattened for market and they are "fed in transit," as the saying is. Some of this feeding in transit is now done on the Great Plains, and a much larger proportion of it might well be, without reducing, but rather increasing, the wheat output of the region.

Furthermore, within the Great Plains the arable lands are interspersed with non-arable grass-producing lands capable of supporting vast herds of cattle if supplementary and winter feeds are provided. Thus it is clear that if we have a proper understanding of the geographical factors in the situation we can take up more intelligently the task of adjusting the interrelation of a group of associated industries through which we may hope to utilize most efficiently the natural resources of this great section of the country.

We hear, not infrequently, some most pessimistic utterances concerning the outlook for the industry of meat production in the West. We hear that our western range lands have been invaded by the wheat farmer and we must soon look to other countries for an increasing proportion of our meat supply. I feel confident that such fears are unwarranted. The former wasteful and inefficient methods of meat production must be and are gradually being replaced. The live-stock population of our western states is gradually increasing, and this increase may be expected to go on more rapidly in the near future and to continue for many years. The limit of our resources in this direction is not yet in sight. Is it not one of the functions of geographers to make the underlying features of this and similar situations a part of our common knowledge in

* This is part of a paper read on April 9, 1915, at the meeting in New York of the Association of American Geographers and the American Geographical Society.

order that our people may not suffer needless misapprehension, and may act wisely in dealing with the legislative and economic problems involved in the utilization of these resources?

Another illustration of the importance of the geographical factor in agricultural industries may be taken from our western irrigated lands. From the very nature of the case this is a problem in space relations. The aggregate area of our irrigated land in the United States is probably not much in excess of fourteen million acres, or about one-third of the area of the state of Iowa. But these lands are scattered over the entire western half of the country, which is but sparsely populated and can consume but a small proportion of the products of the irrigated land. Both the incoming supplies and the outgoing products must bear heavy transportation charges. Because of the cost of preparing the land for irrigation as well as of the cost of water the farming must be intensive in character, that is, the returns per acre must be relatively high.

The problem of profitable industries for our irrigated lands is rendered difficult because of the barrier of distance. And our irrigation farmers seem slow to grasp the significance of the barrier in relation to every phase of their existence. In the history of almost every irrigation enterprise in the West there has been a period of severe economic depression due to this fact of isolation. When a new section is brought under irrigation the first farmers find a ready local sale for their products at good prices. These prices are based upon the cost of the commodities at distant points plus the transportation charges. As soon as the local production exceeds the local demand the scale of prices automatically falls to a point determined by the cost in outside markets *less* the transportation charges. This looks, of course, like a very simple lesson in geography and one that might be learned by observation. But, as a matter of fact, it has been learned by our irrigation settlers only by experience and sometimes very bitter experience.

One naturally thinks of irrigated land as best adapted to the production of fruit and vegetables. But fruit and vegetables are both heavy and perishable, and in consequence the expense and risk of shipment to distant markets are relatively great. It is only in cases where climate or season give special advantages in a monopoly of the market that these industries become permanent and profitable. I refer to the citrus industry of California and the Bermuda onion industry of southern Texas as examples.

For the most part, the products of our irrigated lands come into direct competition with the products of our non-irrigated lands and must depend upon their somewhat larger yields and greater certainty of production to offset the disadvantage of distance to market. In general, we find that conditions on our irrigated land favor the production of forage crops and grain. Somewhat more than eighty per cent. of our irrigated land is devoted to crops of these two classes. Even with the most favorable transportation conditions, the distance which forage crops can profitably be moved is relatively small.

There are comparatively few instances in which these crops can be grown profitably on irrigated land to be shipped to market. We have, then, the problem of establishing industries to utilize them locally or of replacing them at least in part with other crops which can be shipped to market. Thus we may expect to see our irrigated land play an important part in live-stock production in the West.

As an instance of crop replacement I might mention the establishment of the production of long-staple cotton on the irrigated lands of the Southwest. This product is so high priced that the percentage of its value represented by transportation cost is small.

These instances will serve to illustrate the point that the single geographical factor of space relations is a very potent one in determining the character and relationship of our agricultural industries, especially in the western states.

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